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R31Fso

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

FOR OREGON

AS OF

APRIL 1, 1939

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Issued April 11, 1939
Medford Branch of the Oregon Experiment Station
Medford, Oregon

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The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Bureau of Agricultural Engineering of the U. S. Department of Agriculture, in cooperation with the Oregon State Engineer, Oregon Experiment Station and other Federal, State and local organizations. 1/

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1/ The snow measurements are made principally by field personnel of the following organizations:

STATE

Oregon State Engineer and corps of State Watermasters
Oregon Agricultural Experiment Station
Oregon State Highway Engineers
Idaho Cooperative Snow Surveys
Nevada Cooperative Snow Surveys

FEDERAL

Department of Agriculture
  Bureau of Agricultural Engineering
  Forest Service
  Weather Bureau
  Biological Survey
Department of Interior
  Geological Survey
  Bureau of Reclamation
  Indian Service
  National Park Service

PUBLIC UTILITIES

The California Oregon Power Company
Eastern Oregon Light and Power Company
Portland General Electric Company

MUNICIPALITIES

City of LaGrande
City of The Dalles
City of Corvallis

MUNICIPAL DISTRICTS

Deschutes County Municipal Improvement District
Medford Irrigation District
Warmsprings Irrigation District
Ochoco Irrigation District
Grants Pass Irrigation District

2/ Water content determined by melting a measured sample. (The California Oregon Power Company Station)

3/ N. R. = No Report.

STATUS OF RESERVOIR STORAGE AS OF APRIL FIRST

In the following tabulation, water storage in acre feet in some selected Oregon reservoirs as of about April 1, 1939 is compared with storage as of approximately March 1, 1939 and April 1 1938 and 1937.

Storage Reservoir	Stream Basin	Capacity Acre Ft.	Acre Feet in Storage About 4-1-39	About 3-1-39	About 4-1-38	About 4-1-37
Agency Valley	Malheur	60,000	54,280	44,120	49,690	30,000
Antelope	Owyhee	33,434	No report	3,900	22,620	6,070
Clear Lake	Lost River	440,240[a]	249,600[a]	230,160[a]	218,110[a]	77,350[a]
Crane Prairie	Deschutes	55,220[b]	33,000[c]	30,800[c]	Full	40,240
Crescent Lake	Deschutes	80,000[d]	56,760	56,760[e]	35,190	27,430
Drew Creek	Goose Lake	62,500	46,640	33,390	48,830	39,400
Emigrant Gap	Rogue	8,200	Full	2,716	8,155	6,400
Fish Lake	Rogue	7,720	6,202	6,127	4,683	4,992
Four Mile Lake	Klamath[g]	14,000	10,628	10,394	11,767	8,746
Gerber	Klamath	94,000[a]	54,390[a]	36,370[a]	36,920[a,f]	44,390
Hyatt Prairie	Klamath[g]	16,000	11,104	10,810	8,607	4,700
McKay	Umatilla	75,000	60,400	30,110	49,840	25,900
Ochoco	Crooked	47,500	30,630	21,900	27,950	3,440
Owyhee	Owyhee	715,000	688,850	534,020	639,260	682,860
Thief Valley	Powder	17,400	13,420	11,045	17,400	17,400
Upper Klamath Lake	Klamath	524,800[a]	462,500[a]	405,400[a]	459,800[a]	325,900[a]
Wallowa Lake	Wallowa	40,920	38,200	36,960	16,490	7,810
Warm Springs	Malheur	190,000	163,520	141,600	89,250	46,500
Willow Creek	Malheur	26,000	8,250	4,000[h]	1,500	Dry

Note: (a) Available for use. (b) 40,500 by agreement. (c) Reservoir drained fall of 1937. (d) Acre feet capacity changed to 70,000 by temporary agreement for this year. (e) Approximate. (f) 28,000 acre feet released during February and March to prepare for spring inflow. (g) By ditch to Rogue River side. (h) Estimated.

STATUS OF VALLEY PRECIPITATION AS OF OCTOBER 1 TO DATE:

Month	Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		Period	
Section	P	D	P	D	P	D	P	D	P	D	P	D	P	D
S. E.	0.97	+0.38	0.88	-0.09	0.46	-0.59	0.67	-0.43	0.75	-0.32	0.44	-0.34	4.19	-1.39
S. C.	1.23	+0.26	1.68	-0.03	0.86	-0.89	1.25	-0.68	1.27	-0.25	1.04	-0.23	7.33	-1.82
N. C.	0.88	-0.02	1.25	-0.49	0.89	-0.63	0.84	-0.94	1.16	-0.04	0.70	-0.17	5.72	-2.25
Col. Riv.	1.18	+0.12	1.05	-0.70	0.80	-0.80	0.74	-0.90	1.23	-0.11	1.64	+0.58	6.64	-1.81
Wal. Mts.	2.77	+1.96	2.01	-0.89	0.79	-1.28	1.04	-1.22	1.73	-0.39	0.56	-1.14	8.90	-2.96
Blue Mts.	1.51	+0.16	2.28	+0.36	1.25	-0.77	1.17	-0.94	2.26	+0.52	0.55	-1.13	9.02	-1.80
Southern	1.16	-0.99	3.51	-0.38	2.66	-1.39	3.00	-1.08	3.15	-0.30	3.23	+0.47	16.65	-3.67
Willamette	3.94	+0.11	6.71	-1.37	5.73	-1.90	6.04	-1.63	7.27	+1.14	4.30	-1.28	33.99	-5.15
Area	1.70	+0.23	2.42	-0.45	1.68	-1.03	1.84	-0.98	2.35	+0.03	1.56	-0.40	11.55	-2.61

P - Inches precipitation. D - Inches departure from normal.

S. E. - Southeastern Oregon range lands, Harney and Malheur Counties.
S. C. - Southcentral Oregon range lands, Lake County and Klamath County, except the Cascade Mountains.
N. C. - Northcentral Oregon wheat and range lands, Crook, Deschutes, Jefferson, Wheeler and part of Grant Counties.
Col. Riv. - Columbia River area, wheat and range lands, Gilliam, Morrow, Sherman, Wasco and part of Umatilla Counties.
Wal. Mts. - Wallowa Mountain area, forest and range lands, Wallowa and part of Baker County.
Blue Mts. - The Blue Mountain forest and range area, Union and parts of Baker, Grant and Umatilla Counties.
Southern - Southern Oregon irrigated section, Jackson and Josephine Counties.
Willamette - Parts of Polk, Benton, Yamhill, Washington, Lane, and all of Linn, Marion, Clackamas and Multnomah Counties.

Note: Data for the last month shown above are preliminary only, as they are based on a few stations only. Data for earlier months have been corrected to include all the stations in climatological data for the area.

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1939 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (INCHES) One Month ago (3-1-39)	One Year ago (4-1-38)	Two Years ago (4-1-37)	Three Years ago (4-1-36)
UPPER COLUMBIA DRAINAGE												
LOWER SNAKE IN OREGON												
OWYHEE RIVER												
Big Bend	Nev.	30	45N	56E	6800	4-4	9.3	3.4	7.2	11.4	10.5	19.2
Silver City	Idaho	6	5S	3W	6400	3-29	24.1	6.5	6.4	26.6	2.7	20.0
South Mountain	Idaho	19	9S	5W	5100	No report			4.9	1.8	0.0	2.0
Upper Buckskin	Nev.	14	45N	39E	8200	4-1	9.6	3.7	8.0	17.5	8.3	12.5
MALHEUR RIVER												
Blue Mountain Spring	133	21	15S	35E	5900	3-30	29.3	11.1	13.9	23.4	16.1	18.2
Rock Spring	134	23	18S	32E	5100	3-30	2.0	0.9	5.8	8.9	3.9	9.1
Lake Creek	136	10	16S	33½E	5120	3-31	18.8	7.7	11.2	14.3	-	-
Stinking Water	135	6	21S	37E	4800	3-27	0.0	0.0	3.8	1.2	-	-
Crane Prairie	137	24	16S	34E	5375	4-1	12.3	3.8	10.1	11.5	-	-
BURNT RIVER												
Blue Mountain Summit	141	6	12S	36E	5098	3-31	9.6	3.0	9.2	8.9	6.1	9.6
Dooley Mountain	156	32	11S	40E	5430	3-30	9.3	3.0	5.3	-	-	-
Tipton	142	34	10S	35½E	5100	3-29	12.2	3.8	-	9.9	-	-
POWDER RIVER												
Anthony Lake	155	18	7S	37E	7125	3-28	73.1	30.0	21.8	25.0	27.9	24.9
Bourne	154	33	8S	37E	5800	3-30	28.7	11.1	12.9	17.1	10.5	18.3
Dooley Mountain	156	32	11S	40E	5430	3-30	9.3	3.0	5.3	-	-	-

TRIBUTARY BASINS (Primary & Secondary & Snow Courses	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1939 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (INCHES) One Month ago (3-1-39)	One Year ago (4-1-38)	Two Years ago (4-1-37)	Three Years ago (4-1-36)
Eilertson Meadows	151B	18	8S	38E	5400	3-30	22.7	9.8	15.1	15.7	-	-
Gold Center	249	21	9S	36E	5340	3-30	24.8	9.6	12.6	-	-	-
Summit Springs	184	9	6S	37E	6000	3-30	54.9	20.3	-	22.9	25.7	24.0
PINE CREEK												
Schneider Meadows	161	35	6S	45E	5400	3-31	56.8	23.5	-	40.6	-	-
GRANDE RONDE RIVER												
Anthony Lake	155	18	7S	37E	7125	3-28	73.1	30.0	21.8	25.0	27.9	24.9
Aneroid Lake	183	16	4S	45E	7480	3-25	79.3	30.1	-	47.3	27.9	32.5
Beaver Reservoir	188	8	5S	37E	5340	4-6	24.5	8.5	16.6	-	-	-
Moss Spring	186	27	3S	41E	5860	4-3	59.7	28.0	-	29.3	-	-
Schoolmarm	248	28	4S	34E	4775	3-28	13.6	4.4	7.3	-	-	-
Taylor Green	185	3	6S	42E	5740	4-4	37.0	15.7	-	15.8	-	-
Camp Carson	187	33	6S	38E	5970	3-28	31.0	10.6	-	10.2	-	-
Summit Springs	184	9	6S	37E	6000	3-30	54.9	20.3	-	22.9	25.7	24.0
LOWER COLUMBIA DRAINAGE												
WALLA WALLA RIVER												
Tollgate	212	32	4N	38E	5070	3-27	74.0	29.8	34.6	23.0	25.9[a]	41.1
UMATILLA RIVER												
Emigrant Springs	222	29	1N	35E	3925	3-29	18.0	7.7	10.4	3.8	7.9	9.6
Lucky Strike	223	28	3S	32E	5050	3-31	34.0	13.9	14.5	-	-	-
Meacham	221	24&25	1S	35E	4300	3-29	24.4	10.4	13.3	8.2	12.8	13.3

Note: (a) March 17.

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1939 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (INCHES) One Month ago (3-1-39)	One Year ago (4-1-38)	Two Years ago (4-1-37)	Three Years ago (4-1-36)
WILLOW CREEK												
Arbuckle Mountain	241	33	4S	29E	5400	3-28	30.9	11.8	-	13.0	18.7	14.7[a]
JOHN DAY RIVER												
Arbuckle Mountain	241	33	4S	29E	5400	3-28	30.9	11.8	-	13.0	18.7	14.7[a]
Beech Creek Summit	246A	4	12S	30E	4800	3-28	13.1	5.9	7.6	7.3	8.4	2.3[b]
Blue Mountain Spring	133	21	15S	35E	5900	3-30	29.3	11.1	13.9	23.4	16.1	18.2
Blue Mountain Summit	141	6	12S	36E	5098	3-31	9.6	3.0	9.2	8.9	6.1	9.6
Dixie Springs	244	28	11S	34E	6650	3-30	57.7	24.1	-	28.0	22.4	24.9
Gold Center	249	21	9S	36E	5340	3-30	24.8	9.6	12.6	-	-	-
Izee Summit	964	28	16S	29E	5293	3-29	18.9	6.2	9.1	8.8	7.5	10.5
Olive Lake	245	14	9S	33½E	6000	3-30	44.4	15.6	13.5	19.6	17.1	19.3
Schoolmarm	248	28	4S	34E	4775	3-28	13.6	4.4	7.3	-	-	-
Starr Ridge	247	20	15S	31E	5156	3-29	5.3	1.6	5.6[c]	5.0	4.4	4.4
DESCHUTES RIVER												
New Dutchman Flat	324A	21	18S	9E	6400	3-31	156.7	60.9	-	60.2[d]	50.0[e]	53.1[f]
Caldwell Ranch	326	30	21S	8E	4400	4-2	9.8	3.8	-	15.8	13.2	-
Cascade Summit	321	7	23S	6½E	4880	3-27	84.4	38.5	-	31.5	32.5	36.0
Charlton Lake	327	23	21S	6E	5750	4-3	67.8	29.6	-	34.4	30.7	-
Clear Lake	361	29	4S	9E	3500	3-25	34.4	12.5	-	16.7	18.3	16.3
Crescent Lake	325	11	24S	6E	4760	3-27	21.0	12.9	-	16.7	9.5	9.4
Derr	343	14	13S	23E	5670	3-28	22.0	7.5	-	13.4	14.7	-
Hogg Pass	351	24	13S	7½E	4755	3-26	111.2	44.4	-	44.0[g]	-	-
Marks Creek	344	25	12S	19E	4540	3-29	6.5	2.6	5.6	6.1	-	-

Note: (a) April 12. (b) Measurement taken on old course No. 246 nearby. (c) Course direction permanently changed from that formerly used. (d) April 10. (e) April 18. (f) April 29. (g) April 15.

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1939 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (INCHES) One Month ago (3-1-39)	One Year ago (4-1-38)	Two Years ago (4-1-37)	Three Years ago (4-1-36)
Ochoco Meadows	341	21	13S	20E	5200	3-29	20.3	7.6	9.6	14.7	15.0	12.6
Tamarack	342	8	15S	25E	4800	3-29	5.5	1.8	-	8.3	3.9	0.0
Three Creeks Meadows	331	3	17S	9E	5600	3-28	45.0	19.9	-	24.6	26.1	21.5
HOOD RIVER												
Brooks Meadows	431	2	2S	10E	4300	3-29	21.9	9.0	-	19.0	15.5	-
SANDY RIVER												
Still Creek	451	25	3S	8½E	3700	3-30	57.8	25.2	22.4	23.2	23.9	-
Phlox Point - Mt. Hood	452	6	3S	9E	5600	3-30	140.5	65.7	54.7	65.7	67.4	-
CLACKAMAS RIVER												
Peavine Ridge	591	14&15	6S	7E	3500	4-1	55.5	23.3	19.2	23.7	25.2	-
Clackamas Lake	592	35	5S	8½E	3400	3-30	37.4	14.5	13.7	15.7	-	-
WILLAMETTE RIVER												
Cascade Summit	321	7	23S	6E	5200	3-27	84.4	38.5	-	31.5	32.5	36.0
Champion	522	12	23S	1E	4500	4-1	93.2	44.4	37.0	-	-	-
Charlton Lake	327	23	21S	6E	5750	4-3	67.8	29.6	-	34.4	30.7	-
McKenzie	531	35	15S	7½E	4800		No report		-	-	-	-
Mary's Peak	541	21	12S	7W	3620	3-30	34.9	14.8	16.0[a]	-	-	-
Waldo Lake	521A	15	21S	6E	5500	4-3	70.4	31.0	-	33.0[b]	29.0	-

Note: (a) February 17. (b) Course relocated March 31, 1938. 1938 measurement at new location.

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1939 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (INCHES) One Month ago (3-1-39)	One Year ago (4-1-38)	Two Years ago (4-1-37)	Three Years ago (4-1-36)
INTERIOR DRAINAGE												
SILVER LAKE												
Silver Creek	942	25&26	29S	13E	4900	No report			4.4	-	-	-
CHEWAUCAN RIVER												
Mill Creek	922	1	34S	17E	6200	No report			5.4[a]	-	-	-
HARNEY BASIN												
Hart Mountain	971	1	36S	25E	6350	3-26	0.0	0.0	2.8[b]	-	-	-
Idylwild Park	961A	33	20S	31E	5200	3-30	2.3	1.0	5.9	7.7	5.8	8.9
Izee Summit	964	28	16S	29E	5293	3-29	18.9	6.2	9.1	8.8	7.5	10.5
Rock Spring	134	23	18S	32E	5100	3-30	2.0	0.9	5.8	8.9	3.9	9.1
Starr Ridge	247	20	15S	31E	5156	3-29	5.3	1.6	5.6[c]	5.0	4.4	4.4
Fish Creek	965	4	33S	33E	7900	3-26	60.4	22.2	-	-	-	-
Silvies	963	35	32S	33E	6900	3-25	29.9	12.1	-	16.6	6.0[d]	15.4[e]
WARNER LAKE												
Camas Creek	911A	5	39S	21E	5720	3-28	17.1	6.7	-	-	13.2[f]	16.7
WEST COAST DRAINAGE												
UMPQUA RIVER												
Diamond Lake	743	29	27S	6E	5315	3-31	44.7	19.7	18.3	33.1	23.2	-
No. Umpqua near Lake Creek	742	19	26S	6E	4215	3-30	34.1	15.9	17.5	19.7	14.1	-

Note: (a) February 16. (b) February 17. (c) Course direction permanently changed from that formerly used. (d) May 7. (e) April 15. (f) Measurement prior to and including this one taken on old course No. 911 at same elevation, but about four miles distant from No. 911A.

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COURSE MEASUREMENTS About April 1, 1939 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (INCHES) One Month ago (3-1-39)	One Year ago (4-1-38)	Two Years ago (4-1-37)	Three Years ago (4-1-36)
Trap Creek	741	1	27S	4E	3800	3-28	44.1	18.1	15.9	23.3	16.6	-
Whaleback	7217	3	31S	2E	5140	3-29	88.8	38.4	-	45.4	42.0	-
Goolaway Gap	726	32	32S	3W	3000	3-30	0.3	0.1	4.9	10.0	6.3	0.0
Goolaway Mountain	7215	30	32S	3W	3730	3-30	10.0	4.1	10.9	24.0	14.3	-
ROGUE RIVER												
Althouse	7216	17	41S	7W	4400	3-30	15.9	6.7	-	27.6	21.8	-
Annie Spring	831	19	31S	6E	6018	3-31	80.9	37.4	31.6	61.9	43.5	55.3
Big Red Mountain	729	33	40S	1W	6500	3-29	55.9	21.5	-	44.6	34.1	35.6
Billie Creek Divide	722	17	36S	5E	6000	3-20	78.3	33.1	27.8[a]	26.4	26.6	38.3
Fish Lake	725	3	37S	4E	4865	3-21	48.2	19.2	17.1[b]	19.0	16.1	18.7
Goolaway Gap	726	32	32S	3W	3000	3-30	0.3	0.1	4.9	10.0	6.3	-
Goolaway Mountain	7215	30	32S	3W	3730	3-30	10.0	4.1	10.9	24.0	14.3	-
Grayback Peak	727	9	40S	5W	6000	3-31	53.4	29.4	-	52.7	34.2	27.6
Hyatt Prairie Reservoir	723	15	39S	3E	4900	3-29	28.6	12.2	11.9	17.1	13.8	10.5
Little Red Mountain	7210	25	40S	2W	6500	3-29	43.0	17.4	-	37.4	27.1	27.4
Seven Lakes No. 1	7211	3	34S	5E	6800	3-26	125.4	57.5	45.3	72.0	61.1	80.8
Seven Lakes No. 2	7212	26	33S	5E	6200	3-25	103.4	43.3	38.8	49.3	49.9	57.8
Silver Burn	7219	30	30S	4E	3720	3-31	29.1	12.7	15.7	23.3	15.2	-
Siskiyou Summit	728	17	40S	2E	4630	3-31	2.4	1.0	6.6	15.5	11.5	1.9
South Fork Canal	7218	12	33S	3E	3500	3-31	0.0	0.0	9.0	7.4	0.0	-
Wagner Butte	7213	1	40S	1W	6800	3-31	39.5	15.8	14.5	21.6	21.3	19.1
Whaleback	7217	3	31S	2E	5140	3-29	88.8	38.4	-	45.4	42.0	-
KLAMATH LAKE BASIN												
Annie Spring	831	19	31S	6E	6018	3-31	80.9	37.4	31.6	61.9	43.5	55.3
Beatty 2/		22	36S	12E	4300	3-31	0.0	0.0	0.0	0.0	0.0	0.0

Note: (a) February 21. (b) February 19.

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1939 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (INCHES) One Month ago (3-1-39)	One Year ago (4-1-38)	Two Years ago (4-1-37)	Three Years ago (4-1-36)
Billie Creek Divide	722	17	36 S	5E	6000	3-20	78.3	33.1	27.8[a]	26.4	26.6	38.3
Chemult No. 1	834	21	27S	8E	4760	3-31	9.3	5.2	8.7	18.7	8.0	-
Chemult No. 2 2/		21	27S	8E	4761	3-31	0.0	0.0	7.5	18.3	5.0	10.5
Chiloquin 2/		34	34S	7E	4187	3-31	0.0	0.0	3.2	1.5	0.0	0.3
Crowder Flat (California)		30	47N	17E	5200	3-29	0.0	0.0	3.6	-	-	-
Crystal 2/		26	34S	6E	4200	3-31	9.0	4.5	9.0	8.5	10.1	5.5
Fort Klamath 2/		22	33S	7½E	4150	3-31	0.0	0.0	6.1	6.5	4.0	0.2
Hyatt Prairie Reservoir	723	15	39S	3E	4900	3-29	28.6	12.2	11.9	17.1	13.8	10.5
Kirk 2/		1	33S	7E	4533	3-31	0.0	0.0	8.5	7.5	4.5	6.6
Lake of the Woods No. 1	835	11	37S	5E	4960	3-31	27.3	10.3	9.7	18.6	12.8	-
Lake of the Woods No. 2 2/		15	37S	5E	4960	3-31	38.0	13.0	10.5	19.8	13.5	12.0
Quartz Mountain 2/		33	37S	16E	5505	3-31	0.0	0.0	6.9	13.6	9.0	5.2
Pelican 2/		10	36S	6E	4200	3-31	5.0	2.0	5.9	5.5	1.5	0.4
Richardson Ranch 2/		22	35S	14E	4800	3-31	0.0	0.0	2.1	0.8	0.0	0.0
Rocky Point 2/		26	35S	6E	4150	3-31	0.0	0.0	4.8	3.6	2.6	0.4
Seven Lakes No. 1	7211	3	34S	5E	6800	3-26	114.0	52.3	45.3	72.0	61.1	80.8
Seven Lakes No. 2	7212	26	33S	5E	6200	3-25	103.4	43.3	38.8	49.3	49.9	57.8
Summer Rim	841	15	33S	16E	7200		No report		9.2	20.6	14.4	16 .7
Sun Mountain	836	22	32S	7½E	5350	4-1	53.4	23.5	22.9	39.7	26.2	-
Taylor Butte	842	16	33S	11E	5100	4-3	0.0	0.0	3.8	11.3	4.8	-
Yamsey 2/		19	30S	11E	4600	3-31	0.0	0.0	1.9	2.2	5.5	0.1
Strawberry	837	4	40S	16E	5600	3-30	10.4	4.0	8.7	-	-	-
Quartz Mountain	811	2	38S	16E	5320	3-31	0.0	0.0	4.8	-	9.4	-
GOOSE LAKE BASIN												
Camas Creek	911A	5	39S	21E	5720	3-28	17.1	6.7	-	-	13.2[b]	16.7
Quartz Mountain 2/		33	37S	16E	5504	3-31	0.0	0.0	6.9	13.6	9.0	5.2
Quartz Mountain	811	2	38S	16E	5320	3-31	0.0	0.0	4.8	15.7	9.4	10.2
Strawberry	837	4	40S	16E	5600	3-30	10.4	4.0	8.7	-	-	-

Note: (a) February 21. (b)Measurement prior to and including this one taken on old course No. 911 at same elevation, but about four miles distant from No. 911A.

IRRIGATION WATER SUPPLY FORECASTS

SEASON OF 1939

F o r e w o r d

During the period from March 20 to April 6, measurements of snow depth and water content were secured on all snow courses in Oregon.

For the reason that a great many of the Oregon courses are but newly established, and in view of the further fact that on very few of the courses do the records extend back for more than a few years, it has been difficult to arrive at definite correlations between water on the ground as snow and subsequent stream flow. In the case of certain stream basins, however, correlations have been made. Full use has been made of correlations developed by engineers of cooperating agencies.

Lacking the extended records on which accurate forecasts must be based, but believing that information accumulated to date is of value in forming general estimates of prospective water supplies for Oregon in 1939, a series of water forecast committee meetings were held in important irrigated regions of Oregon for the fourth consecutive year during the period April 5 to 12, as follow: Medford for Southern Oregon; Bend for Central Oregon; Burns for Eastern Oregon; Union for Northeastern Oregon; Hermiston for the Umatilla-Walla Walla River Basin and Portland for the Columbia River Basin, embracing drainages in seven states and British Columbia. Most of the cooperating agencies were represented at those round-table discussions.

An informal report was prepared of the results of each meeting, outlining the irrigation water supply prospects as of April 1 for various Oregon stream basins. The gist of these reports is reproduced herewith. It is understood, of course, that later modifications of the forecasts may be required in accordance with unforeseen deviations of precipitation and temperature from normal during the run-off season.

Forecasts

Southern Oregon

Measurements throughout the Cascade and coast range mountains show that snowfall was nearly normal on March 1, but since early March snowfall at the higher elevations, and rainfall in the valleys, has been far below normal. Consequently, on April 1 snow water content on nearly all snow courses on various Southern Oregon stream basins was below normal. In the mountains in the eastern part of Southern Oregon, especially in the Gerber and Clear Lake watersheds in the Klamath-California area, the snow cover is much less than that recorded last year. Likewise, in the Upper Klamath Basin, there is less water in the form of snow on the ground now than at any time for several years.

Since early March the snow cover has receded from below 3,000 feet to approximately 5,000 feet. Moderately heavy runoff from these diminishing snow fields occurred, but now is definitely decreasing. The snow between 5,000 and 6,000 feet elevations has shown considerable melting during the past month, with consequent reduction in water content, but above 6,000 feet appreciable melting has not yet taken place.

At all elevations on all watersheds, with the exception of an area in the Upper Klamath Lake Basin, soils are unfrozen and moderately wet. Soil freezing at Chemult still is reported to extend to a depth of 16 inches. Unless unusual weather conditions prevail during the coming runoff season, high stream flow peaks during April and May are not expected and it seems probable that stream flow, particularly in the smaller streams, originating below elevations of 5,000 feet, will continuously decrease from this period on.

Although snow water contents on some watersheds are the lowest since 1934, expected stream flow may not be decreased to the low points of 1934 because of the fact that watershed soils were so well primed in 1938 that a favorable hold-over effect will exert some influence in maintaining stream flows this year above an extremely low level.

Low flow of Rogue River at Raygold during the months of July, August and September is expected to be 35% less than last year, reaching a minimum in September when probable minimum low flow for the month will only slightly exceed 800 cubic feet per second. Rogue River flow at Raygold for the stream flow year is expected to be 103% normal.

The flow of the North Fork of Rogue River will not be as great as it was last year, when for the twelve month period the flow was 136% normal. The flow of the North Fork of Rogue River above Prospect is expected to be very close to normal this coming season.

Low flow of the Applegate is expected to be inadequate to satisfy all river rights and probably will be 40% less than last year or not over 80% normal.

The low flow of Evans and Graves Creeks and smaller irrigation streams originating at relatively low elevations in the Umpqua and coast ranges will be entirely contingent upon precipitation from now on. If water from melting snow furnishes the basis of the supply, low flow of these streams will not be more than one-half that of last year and may possibly be less.

No attempt is made to forecast runoff for the Illinois River because of incomplete information, but low flow will be very materially less than that of last year and may compare similarly with flow of 1934.

On the main Umpqua River, flow for the twelve months stream year will be less than last year, but should be about normal. However, for the

important tributaries principally depended upon for irrigation supplies, such as Cow Creek, low flow will be very much less than last year and may not exceed that of 1934.

Farm soils in the Rogue River valley are not wetted to as great a depth as last year and because of lack of precipitation during the past month, are in need in some locations of irrigation in the near future. However, storage water supplies expected to be available for irrigation in the irrigation districts will be sufficient. Emigrant Gap reservoir is now full to capacity and although Fourmile, Fish Lake and Hyatt Prairie reservoirs are not filled to capacity, it is forecasted that they will fill.

The growing season is well advanced over normal and although that may result in little difference in harvest dates for grains and grasses, it is expected to advance the harvest date of fruits and bulbs. Consequently, this will tend to offset in some degree the anticipated late season water shortage.

The net inflow into the Upper Klamath Lake for the stream flow year October 1, 1938 to September 30, 1939 is set at 65% of normal, or approximately 875,000 A.F. Farm lands in the Klamath Basin are wet to depths of only two to three feet as contrasted with at least 8½ feet last year and with three or four feet during the average winter. There will be ample irrigation water supplies for this area during the coming season as usual, although dry land operations are now definitely suffering from lack of soil moisture. The runoff in the Clear Lake reservoir for the stream flow year 1938-39 is expected to be only 45% of normal, or about 48,000 A.F. as contrasted with an inflow last year of 294,600 A.F. To Gerber reservoir for the stream flow year ending September 30, 1939, inflow is set at 25,000 A.F. or about 50% of normal as contrasted with 115,400 A.F. last year. While neither reservoir will fill, supplies are available now for two years.

Low elevation ranges from present indications will be short this year unless heavy precipitation comes soon. Because of rapid retreat of the snow cover to a relatively small area at the higher elevations, larger watershed areas are now exposed to early summer drying than usual and this factor compounded by heavy snow breakage of timber last year is expected to result in a hazardous and long extended fire season.

Central Oregon

Snow depth and water content studies for the drainage area contributing to the Ochoco reservoir show that potential water supplies are very much less than last year and also less than in either of the two previous years. Ochoco reservoir now has in storage approximately 30,800 acre feet, But with only limited inflow from scanty snow fields, peak storage is not expected to exceed 35,000 to 38,000 acre feet, or about 75 percent of capacity. The soil on the watershed is mostly unfrozen,

but ground storage conditions are not as favorable as they were at the beginning of the runoff season in 1938.

Although snow water conditions at Three Creeks Meadows near the headwaters of Squaw Creek are not as favorable as last year or the two years previous, sufficient water supplies are in sight for the Squaw Creek Irrigation District. The Plainview and McAllister ditches are expected to be shut off earlier than usual and may not receive water after about July 1.

The flow of Little River probably will not exceed 70 to 75 percent of that of last year, but this deficiency in flow will be at least partially offset by the heavy water content existing in the snow fields along the Cascade divide where snow water content on several widely separated courses equals or slightly exceeds that of last year and is above normal. Consequently, low flow of the main Deschutes should not be less than that of last year even in the face of a snow shortage at lower elevations.

Crane Prairie reservoir now has in storage 33,000 acre feet and will fill to the capacity limited by agreement. Crescent Lake, with 57,000 acre feet now in storage, is expected to fill to a capacity limited by a temporary agreement at 70,000 acre feet, by early June. This will be the greatest storage obtained in this reservoir since 1923. Ample water supplies will be available for the Tumalo project lands.

Spring range is expected to be very short in the Ochoco Forest this year unless unusually favorable precipitation occurs soon. Grazing conditions on the high prairie seem to be near normal.

An unusually extended and more troublesome fire season is anticipated by foresters because of the exceptionally early recession of snow cover to higher elevations and the hold-over of above normal growth of grasses last year.

Eastern Oregon

Snow water contents in the mountainous areas in northern Nevada and southwestern Idaho contributing Owyhee water supplies were relatively high this year. Runoff for the stream year ending September 30, 1939 is estimated at 600,000 acre feet. With a discharge of 377,000 acre feet already obtained, runoff for the next six months is estimated at 223,000 acre feet. On April 1, 688,850 acre feet were stored in Owyhee reservoir, and the reservoir will fill to capacity in a very short time, thus assuring at least a two year water supply to irrigated lands under the Owyhee. This year's flow of Owyhee is estimated at 64 percent of last year and 73 percent of normal. Anticipating filling the reservoir, 88,000 acre feet were spilled down the "glory hole" in March. The natural low flow of Owyhee is expected to be below normal, but not seriously so.

Soil moisture conditions in Jordan Valley are more favorable than in the north end of Malheur County and although definite snow measurements

are lacking, reliable information indicates that Arock reservoir may again fill to capacity this year.

Warmsprings reservoir now holds 170,000 acre feet and is expected to peak in storage at full capacity, 190,000 acre feet, by April 20. Agency Valley reservoir will fill. After June 1, natural flow of the Malheur River will be materially below that of last year and is not expected to exceed 90,000 acre feet for the stream flow year. Flow of the Malheur will be about 61 percent of that of last year.

Soil moisture conditions on cultivated lands near Ontario and Vale are more unfavorable than in any spring during the past several years, and immediate demand for irrigation water is expected.

Contrary to prevalent opinion, heavy stream flows into the John Day valley during May and June are not to be expected unless unusually concentrated precipitation occurs. Although on March 1, snow conditions appeared as favorable as at any time during the last several years, snowfall during March was distinctly below average and, because of high average temperatures, snow water content throughout the entire watershed below elevations of 6500 feet decreased materially between March 1 and April 1. Consequently, on April 1 snow water content on the John Day watershed averaged only 62 percent of that present a year ago. Considerable snow remains on north slopes but these snow fields are not expected to contribute to any delayed flush spring runoff. It looks as if the tributaries of the John Day will show about a 75 percent normal flow during the irrigation season. The lower tributaries of the John Day, even under the most favorable conditions affecting runoff, are expected to provide an insufficient low water flow, and low water flow will be less than that of last year. While the early spring outflow from snowfields has materially reduced water supplies stored as snow, a certain amount of water has gone into ground storage which may be expected to prevent an extreme low flow reduction that otherwise would be expected from the scanty remaining snow supplies. Soil moisture conditions are now less favorable than for several years in the lower part of the John Day area. High range conditions are reported to be good.

In the Harney Basin Valley precipitation is now at a 25-year average, but is only 50 percent of that obtained at this time last year. Peak flow of streams entering the Harney Valley appears to have been reached and these tributaries are expected to decrease in flow from now on. Flow of Silver Creek this year has probably reached its peak and this drainage area will deliver only about 50 percent of the water that it delivered to Harney Valley hay lands last year, which is about the same as in 1935-36.

The streams feeding Catlow Valley have shown only about normal runoff so far and cannot be expected to deliver the supply of water they delivered last year, as high elevation snow supplies are so reduced that runoff henceforth may be only from one fourth to one tenth that of last year. A ground water storage reserve from last year may tend to bolster low water flow somewhat. Donner and Blitzen River flow during March was

heavier than at any time since 1935. Peak flush flow of the Blitzen is probably over, but with fairly good snow supplies remaining on Steens Mountain, a fair sustained low flow is expected, but probably it will be 30 percent less than that of last year. On the Diamond side of the mountain, irrigation supplies will be short.

Forage grasses are making excellent early season growth in the Hart and Steens Mountain areas.

In the Lake County area soil moisture conditions in general are not favorable and dry-land farming prospects are nowhere near as favorable as last year. Precipitation at Lakeview from October to March inclusive, is only 43 percent of that for the same period last year. Soil moisture is greatly depleted around the Fort Rock area and on the low desert below Paisley is reported at 10 to 14 inches including, on uncultivated lands, some carry-over from last season.

Drews Creek reservoir has in storage 50,000 acre feet, but will not fill and probably will peak in storage at 52,000 acre feet, or about 83 percent of capacity. However, this will assure at least a two-year water supply for the lands now served by this reservoir. Thompson Valley reservoir is reported to hold the same supply as last year at this time, but unlike last year, this reservoir will not fill. Cottonwood reservoir will not fill. The Chewaucan River will be short and low flow may only equal 30 to 50 percent of that of last year. Although water supplies to the Warner Valley will be materially less than last year, the supply will probably be sufficient to bring crops to maturity. It seems doubtful if Hart Lake will much more than overflow this year.

Northeastern Oregon

Spring snow surveys on Powder River watersheds show that snowfall during March was distinctly below normal and, because of unusually high March temperatures much melting took place below the 5500 foot elevation. Above this elevation snow conditions are as favorable as at any time for the past several years, but since the very high elevations contribute only a relatively small part of the total flow of the Powder, favorable conditions there will be more than offset by the snow deficiency at low to intermediate elevations. Some of the upper tributaries of the Powder are expected to have flow reduced only 20 percent from that of last year. North Powder is expected to have a greater water flow during the late season than in any one of the last four years. However, so far as the main Powder is concerned, it now appears that low flow may be only about 70 percent of last year's flow. It is entirely possible that the main peak flow of Powder has been passed, although this is contingent upon weather to come. Peak flow of the North Powder is still to come. On the lower river, Thief Valley reservoir is full and overflowing.

Snow supplies remaining on Burnt River watersheds are greatly reduced from any previous measurements taken since snow courses were established in 1935. Unity reservoir is full and spilling water. Low water flow into Unity reservoir is expected to be very low especially on the north fork where supplies may become deficient earlier than usual. Total low flow of Burnt River probably will not exceed 65 percent of that of last year.

On the main Grande Ronde River the snow situation is quite similar to that on the Powder, and flow of the Grande Ronde is not expected to exceed 80 percent of that of last year. However, on Catherine Creek snow water supplies are only slightly less than at this time last year, but since ground storage conditions are not quite so favorable both total flow and low flow of Catherine Creek are expected to be 10 percent less than last year.

Over in the Wallowa mountains both snow depth and snow water content are materially less than last year, with water content at Aneroid Lake and Schneider meadows averaging 40 percent less than last year. However, water supplies in Pine Valley were the best last year for the past 30 years and, although water supplies this year will be materially less than last year, they should be about normal. Wallowa Lake will again spill water this year.

Soil moisture conditions appear to be normal in Wallowa and Northeastern Baker Counties, but are deficient in Union County when compared with last year. Precipitation records of the Eastern Oregon Light and Power Company indicate that precipitation around the rim of the Powder and Grande Ronde valleys now closely approaches the average of the past 12 years and equals three-quarters of that of last year at this time.

Range conditions in the Whitman Forest at the lower elevations are not expected to be as good as last year, but will be better than average. At very high elevations, later range should be very good. Lower ranges near Enterprise are reported as dry.

The fire season in the forests is expected to start earlier than usual because of the abnormally rapid recession of snow cover and consequent drying at lower elevations.

Umatilla-Walla Walla Basin

Forecasts for summer irrigation water supplies are better for most parts of this area than in many irrigated sections elsewhere in the State. Forecasted flow for the six months period ending September 30 will be greater than last year on the Walla Walla and Umatilla Rivers and on McKay Creek, but the flow of Butter Creek is expected to be considerably under that of the same period last year. On all of these streams, with the exception of Butter Creek, the total flow for the stream year also will be greater than for the stream year 1937-38. On Butter Creek, about one half

the total annual flow is yet to come. Compared with an eleven year average, flow of all of these streams will be from normal to 20% greater than normal. The critical break into low flow for the Umatilla River is expected to come at about the same time as last year in mid-May.

Tabulated stream flow forecasts follow:

Stream	Forecasted Run-off in Acre Feet	
	Stream Year 1938-39	Six Months April 1 - Sept. 30
South Walla Walla River	125,000	71,000
Umatilla River at Gibbon	157,000	75,000
Umatilla River at Pendleton	363,000	160,000
McKay Creek	64,000	18,000
Butter Creek	11,000	5,000

Cold Springs reservoir is full and the McKay reservoir, with approximately 65,000 acre feet now in storage and with considerable flow still to come from McKay Creek, is expected to fill before the last of April and may spill from 10,000 to 15,000 acre feet.

Earlier irrigation than usual has restored soil moisture to a favorable point and if the season ahead proves of usual character, a fairly substantial hold over supply may be left in McKay at the end of the irrigation season.

Soil moisture conditions are about average in wheat fallow land in northern Sherman County, but this year penetration in stubble land is only about one-half of that found last year at this same time. Wheat crop prospects, therefore, seem about average in that area for this year, but are not so good for 1940. In the southern part of Sherman County and in Jefferson County, soil moisture conditions appear much less favorable than in the northeastern part of the Columbia River Basin region.

At Hermiston, alfalfa lands were wet into the fourth foot this spring and the moisture penetration was not much less than last year. Loss of soil moisture has exceeded rate of replenishment during the last thirty days on lower range lands and with advancing root activity, the upper six inches of soil in much of the lower range has become very dry. Rain is needed to prevent lower range from being shorter than usual. Higher ranges are fully as good as last year.

Streams supplying irrigated land in Wasco County may be expected to furnish extremely deficient flow and low water flows may compare somewhat with those of 1934.

Water supplies in the Hood River valley are expected to be as good as usual.

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